

WHAT IS CLAIMED IS:

- 10041631-011002
1. A light alloy wheel for a vehicle comprising a disc portion comprising a hub portion and a design portion and a rim portion, said design portion having substantially as-die-cast spoke portions having at least partially taper angles of less than  $5.0^\circ$ .
  2. The light alloy wheel for a vehicle according to claim 1, wherein a substantially as-die-cast dent portion having at least partially a taper angle of less than  $5.0^\circ$  is formed on the rear side of each spoke portion.
  - 10 3. The light alloy wheel for a vehicle according to claim 1, wherein those having a taper angle of less than  $5.0^\circ$  among said spoke portions have a minimum width of 5 mm or less and a height of 20 mm or more.
  4. The light alloy wheel for a vehicle according to claim 1, wherein said spoke portions have a taper angle of  $4.0^\circ$  or less.
  - 15 5. The light alloy wheel for a vehicle according to claim 4, wherein said spoke portions have a taper angle of  $3.5^\circ$  or less.
  6. The light alloy wheel for a vehicle according to claim 1, wherein said spoke portions have a ceiling thickness of 5 mm or less.
  7. The light alloy wheel for a vehicle according to claim 1, wherein at least part of said spoke portions have a DAS value of less than  $30\ \mu\text{m}$ .
  - 20 8. The light alloy wheel for a vehicle according to claim 1, wherein the maximum DAS value of said rim portion is larger than the DAS value of said hub portion.
  9. The light alloy wheel for a vehicle according to claim 1, integrally cast by a low-pressure casting method.
  - 25 10. A method for producing a light alloy wheel for a vehicle, said light alloy wheel comprising a disc portion comprising a hub portion and a design portion and a rim portion, said design portion having substantially
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as-die-cast spoke portions having at least partially taper angles of less than 5.0°, said method comprising using a casting apparatus comprising a die assembly comprising at least a stationary lower die and a movable upper die, a movable platen to which said upper die is fixed, and one cylinder  
5 mounted onto a frame of said apparatus for moving said movable platen; and driving said cylinder to slowly reduce the clamping force of said lower die and said upper die.

11. The method for producing a light alloy wheel for a vehicle according to claim 10, wherein a piston-lowering hydraulic pressure of said  
10 cylinder is reduced to zero over a time period of 0.05 seconds or more while a constant piston-elevating hydraulic pressure is applied to said cylinder, to slowly reduce said die-clamping force.

12. A method for producing a light alloy wheel for a vehicle, said light alloy wheel comprising a disc portion comprising a hub portion and a  
15 design portion and a rim portion, said design portion having substantially as-die-cast spoke portions having at least partially taper angles of less than 5.0°, said method comprising using a casting apparatus comprising a die assembly comprising at least a stationary lower die and a movable upper die, a movable platen to which said upper die is fixed, and a first cylinder  
20 and at least three synchronous second cylinders both mounted onto a frame of said apparatus for moving said movable platen; synchronously driving said second cylinders to elevate said movable platen in parallel from a position at which said lower die and said upper die are clamped to a position at which said wheel would not impinge on said lower die even if  
25 said movable platen were slanted; and then further elevating said movable platen by said first cylinder.

13. A method for producing a light alloy wheel for a vehicle, said light alloy wheel comprising a disc portion comprising a hub portion and a

design portion and a rim portion, said design portion having substantially as-die-cast spoke portions having at least partially taper angles of less than 5.0°, said method comprising using a casting apparatus comprising a die assembly comprising at least a stationary lower die and a movable upper die, a movable platen to which said upper die is fixed, a first cylinder and at least three synchronous second cylinders mounted onto a frame of said apparatus for moving said movable platen; driving said first cylinder to slowly reduce the clamping force of said lower die and said upper die; synchronously driving said second cylinders to elevate said movable platen in parallel from a position at which said lower die and said upper die are clamped to a position at which said wheel would not impinge on said lower die even if said movable platen were slanted; and then further elevating said movable platen by said first cylinder.

14. The method for producing a light alloy wheel for a vehicle according to claim 13, wherein a piston-lowering hydraulic pressure of said first cylinder is reduced to zero over a time period of 0.05 seconds or more while a constant piston-elevating hydraulic pressure is applied to said first cylinder, to slowly reduce said die-clamping force.

15. The method for producing a light alloy wheel for a vehicle according to claim 12, wherein said second cylinders are four hydraulic cylinders arranged at symmetric positions.

16. The method for producing a light alloy wheel for a vehicle according to claim 10, wherein a die-cast dent portion having at least partially a taper angle of less than 5.0° is formed on the rear side of each spoke portion.

17. An apparatus for producing a light alloy wheel for a vehicle, said light alloy wheel comprising a disc portion comprising a hub portion and a design portion and a rim portion, said design portion having substantially

as-die-cast spoke portions having at least partially taper angles of less than 5.0°, said apparatus comprising a die assembly comprising at least a stationary lower die and a movable upper die, a movable platen to which said upper die is fixed, and a vertical movement mechanism of said movable platen mounted onto a frame of said casting apparatus; said vertical movement mechanism comprising (a) a first cylinder for moving said movable platen up and down, and (b) at least three second cylinders synchronously driven for elevating said movable platen in parallel from a position at which said lower die and said upper die are clamped to a position at which said wheel would not impinge on said lower die even if said movable platen were slanted; and said movable platen being elevated by said first cylinder above the upper limit position of said second cylinders.

18. The apparatus for producing a light alloy wheel for a vehicle according to claim 17, wherein said first cylinder slowly reduces the clamping force of said lower die and said upper die during the process of opening said die assembly.

19. The apparatus for producing a light alloy wheel for a vehicle according to claim 18, wherein a piston-lowering hydraulic pressure of said first cylinder is reduced to zero over a time period of 0.05 seconds or more while a constant piston-elevating hydraulic pressure is applied to said first cylinder, to slowly reduce the die-clamping force.

20. The apparatus for producing a light alloy wheel for a vehicle according to claim 17, wherein said second cylinders are four hydraulic cylinders arranged at symmetric positions of said frame.

21. The apparatus for producing a light alloy wheel for a vehicle according to claim 17, wherein a die-cast dent portion having at least partially a taper angle of less than 5.0° is formed on the rear side of each

C spoke portion.

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